2021

Peer Review of Teaching Project Course Portfolio – CNST 434

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Peer Review of Teaching Project

Course Portfolio – CNST 434 by Vishnu Reddi

University of Nebraska

Author Note

This is a course portfolio for a 400-level undergraduate course in Construction Management.

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Peer Review of Teaching Project: Course Portfolio – CNST 434

Course Title

Construction (CNST) 434: An introduction and study of the current processes and professional trends in 'Design-Build' (D-B) as a construction project delivery system.

Course Description

The overarching goal, or theme, of the course is to achieve a working familiarity with the organizational, management, ethical and legal principles inherent to this rapidly growing construction delivery option. This is a 400-level course that has inconsistently been offered as a technical elective and this effort is to develop the course further in order to establish it as a prominent and consistently offered technical elective. The course is intended for sophomores that may be looking to pursue an internship over the summer months; juniors, who might have had an internship or are pursuing an internship over the summer months; and seniors who may be graduating into industry positions that manage and deliver D-B projects.

Course Goals

This course lays a foundation for a student's success in their upper-division construction classes such as project controls and capstone. It is also intended to provide some useful tools to graduating seniors who will be taking positions that manage and deliver D-B projects. At the most basic level, by the end of the semester, students will demonstrate, via presentation and interview, a good understanding of the concepts associated with Design-Build construction. Students will be able to articulate various concepts in the areas of the characteristics of D-B teams, planning, helping design and

construct D-B projects. They will be able to read and critique construction documents and be able to explain their significance and meaning to non-specialists. Students will demonstrate, orally and in writing, the ability to develop the various steps associated with a successful Design-Build project. I envision this course broadening our student's' perspectives on construction delivery methods and preparing them to be critical thinkers and innovators. By focusing on the achievement of these applications, an overarching goal that permeates all goals is to engage students in a way that fosters innovative ideas that they can take with them as they embark on their professional careers.

Rationale for course selection

I had spent 14 years in industry before joining the faculty here at Nebraska and it has been my experience that D-B construction is a very collaborative effort. Usually, the architects, engineers and construction managers are working in an entrepreneurial environment to deliver specific results. I chose this course because it is the undergraduate course that is an elective that is taught to Construction Management students, but it truly can reach a wider audience such as engineers, architects and communication specialists that are looking for work in construction related industries.

Key Goals of Completing the course portfolio.

First, in addition to documenting the successful achievement of the goals outlined for the course, I would particularly like to document and assess the effectiveness of balancing various teaching strategies. While, I see the purpose and effectiveness of a lecture to a certain degree, I am committed to incorporating active and applied learning into this course as I believe that it is best to learn by doing. Second, I envision this course becoming one that could be used by a graduate student to practice teaching

methodologies that he/she might find beneficial in his/her career in academia upon completion of their program of study. I believe the reflection provided in this course portfolio will assist future instructors in their own planning of challenging courses during challenging times. Third, I want this course to energize students to think critically about construction and begin to improve the industry they are about to join. I would like for this course to help future generation of construction professionals build it better than ever before.

Enrollment and Demographics

This course was currently open to Construction Management and Construction Engineering students. This semester we had a total of 11 students. We had 8 graduating seniors, and 3 juniors. The entire demographics have been provided in Table 1.

Teaching Methods, Course Materials and Class Activities

The framework of the course is described in detail in Appendix A. As mentioned previously in my rationale section the foremost goal of this portfolio was to record the use of different teaching strategies. The strategies that I used were the traditional lecture format to disseminate new information. There were reading assignments coordinated with the topic of the class lecture in order to offer multiple points of "touch" with the material. I also used a mix of individual assignments and "milestone" group assignments. The individual assignments gave me strategically timed opportunities to evaluate individual growth through the duration of the course. The milestones gave me strategically timed opportunities to evaluate the work of the team and provide "formative" feedback to incorporate as the students worked toward a final proposal that is the culminating document illustrating their understanding of the course material.

I also incorporated industry professionals to deliver some of the content of this course. Table 2 describes the roles used from industry to help students learn in this course.[1] I also utilized a combination of "low stakes" activities to foster an entrepreneurial environment coupled with strategically placed "high-stakes" activities to ensure critical thinking. There was a service learning

Summary of Results

This being a benchmark portfolio, the goal was to establish effectiveness of the course and record a baseline. This portfolio is meant to provide a "launch pad" for someone establishing a new course or a starting point from which to make improvements to a course that is similar in discipline, material, and structure.

Analysis of Student Learning

The students responded well to this format of instruction and is evident in the scores that the students acquired in this course. Details of the scores are provided in Table 3. The feedback received from students reflected that they enjoyed the format of the course and would expect it to be part of the core curriculum in the program going forward. As ca neb seen in Figure 1, it is crucial to include the following:

1. A healthy combination of individual assignments and team-based assignments (a.k.a. milestones)
2. The individual assignments provide an opportunity to provide customized "formative" feedback to enhance the learning experience of the student.
3. The team-based assignments, a.k.a. milestones, provide crucial building blocks toward the final project work that is submitted at the end of the semester. This enables the students to receive and process "formative" feedback as a group working toward a

common goal. The student is then able to apply this knowledge and feedback to produce a final project submission that can be evaluated in a summative manner.

Reflections on course

The results from the course reflect that this team-based format is an effective way to teach a course such as CNST 434. It is also important to balance various teaching methodologies such as traditional formats with more innovative ones. Based on my experience in industry, the field of construction management is infused with adversarial relationships and I firmly believe that this instructional format, in which there is a balance of various teaching methodologies, has proven effective for student learning. This baseline portfolio presents a new instructor with a framework from which a new course can be launched or an existing course can be improved. It was a pleasure to see the students being engaged and applying their knowledge and skills to improving an existing building that acted as the service learning project.

References

Wiggins, Grant (1998), Understanding by Design

Jackson, Barbara J. (2011), Design-Build Essentials

Footnotes

[1] Industry roles were introduced in ma more limited fashion than desired due a semester that was during the COVID-19 pandemic. I do not believe that the effectiveness of what was presented was hindered by social distancing requirements as the class was held in-person.

Tables

Table 1

Class Demographics

Seniors	Juniors	Male	Female
8	3	9	2

Table 2

Roles from Industry

Role	Topic of Focus	Early in Semester	Mid-Point in Semester	Later in Semester
Architect	Programming Statement	Yes	No	No
Engineer	RFQ	Yes	Yes	No
Construction Manager	Various	Yes	Yes	Yes
Engineer	RFP	No	Yes	Yes
Owner's Representative	Owner Expectations	Yes	Yes	Yes

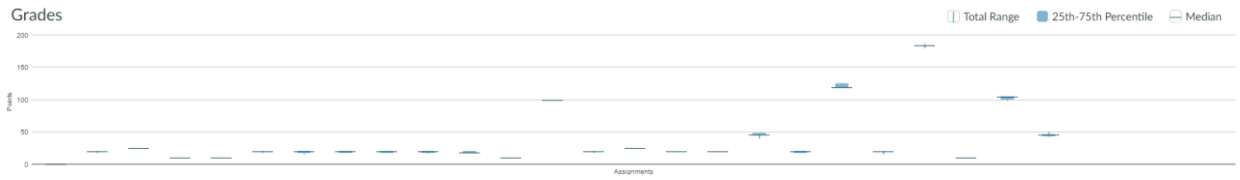
Table 3

Distribution of Grades

Student	Submissions	On Time	Late	Missing	Score
1	22	22	0	0	96.14
2	21	20	1	1	94.28
3	21	21	0	1	94.78
4	20	20	0	2	93.79
5	20	20	1	2	94.78
6	21	21	0	1	95.19
7	21	21	0	1	93.98
8	22	22	0	0	96.19
9	21	20	1	1	94.72
10	22	21	1	0	95.84
11	22	22	0	0	94.88

Figures

Figure 1: Details of timing of "low stakes" activities and "high stakes" activities.



Appendices

Appendix A – Learning Objectives and Course Plan

Appendix B – Course Syllabus

Appendix A

CNST 434
Design-Build Project Delivery
Spring 2021

Week	Dates	Advanced Preparation	Assignment	Project Topic	Session Topic
1	26-Jan	N/A	CATME Survey	N/A	1: First Day of Class
	28-Jan	Read Syllabus	Quiz 1: Syllabus & Learning Objectives		2: Why Design-Build?
2	2-Feb	Chapter 8	Quiz 2: Dynamics of High Functioning Teams	Milestone 1: RFQ Checklist Development	3: Teaming
	4-Feb	N/A	N/A		4: Hands-On Workshop
3	9-Feb	Chapter 3	Quiz 3: Fundamental Characteristics of D-B	Milestone 2: Go / No-Go Matrix Development	5: Interpreting the RFQ
	11-Feb	N/A	N/A		6: Hands-On Workshop
4	16-Feb	Chapter 5	Quiz 4: Getting Ready to Compete	Milestone 3: Agenda & Question Development	7: Agenda Creation & Valuable Questioning
	18-Feb	N/A	N/A		8: Programming
5	23-Feb	RFQ & Attachments	Quiz 5: Program Statement	N/A	9: Client Expectations
	25-Feb	N/A	Reflective Writing		10: Meet The Client
6	2-Mar	Chapter 4	Quiz 6: Buying D-B Services	Milestone 4: Branding & Identity	11: Responding to the RFQ
	4-Mar	N/A	N/A		12: Procuring D-B services
7	9-Mar	N/A	N/A	RFQ Response Due	13: Hands-On Workshop
	11-Mar	N/A	N/A		14: How to Write a Winning Spec
8	16-Mar	SPRING BREAK	SPRING BREAK	SPRING BREAK	SPRING BREAK
	18-Mar	SPRING BREAK	SPRING BREAK		SPRING BREAK

Week	Dates	Advanced Preparation	Assignment	Project Topic	Session Topic
9	23-Mar	Chapter 2	Quiz 7: Planning, Designing & Constructing Projects	Milestone 5: RFP Checklist Development	15: Responding to an RFP
	25-Mar	N/A	N/A		16: Developing A Competitive Advantage
10	30-Mar	Chapter 1	Quiz 8: RFP	Milestone 6: Self Performing Wrok & Subs	17: Estimating for Design-Build Projects
	1-Apr	N/A			18: Hands-On Workshop
11	6-Apr	Chapter 9	N/A	N/A	19: A Winning Proposal
	8-Apr	N/A	Specification Development		20: Managing D-B
12	13-Apr	Chapter 6	Quiz 9: Developing D-B Estimates	RFP Response Due	23: Hands-On Workshop
	15-Apr	N/A	N/A		26: Client Decision Making
13	20-Apr	Chapter 7	Quiz 10: Managing D-B	Presentations	Hands-On Workshop
	22-Apr	N/A	Submit Presentations		Student Presentations
14	27-Apr	NO CLASS	NO CLASS	Milestone 7 & Final RFP Due	NO CLASS
	29-Apr	NO CLASS	NO CLASS		NO CLASS
15	4-May			Take Home Exam & Peer Evaluation Due	
	6-May				

Appendix B

1. Course Number and Name:

Number: CNST-434
Name: Professional Trends in Design/Build

2. Credits and Contact Hours:

Credit Hours: 3 credit hours
Contact Hours: 60 contact hours

3. Instructors:

Prof. Vishnu Reddi, PE, PMP (vish@unl.edu), Room 113 Nebraska Hall, 402-472-7431
Office hours will be as posted. If not posted, please schedule office hours as needed.

4. Textbook and Other Supplementary Materials:

- Text: "Design-Build Essentials" by Barbara J. Jackson
- Various printed materials will be provided on Canvas as a part of the course
- Plans and specifications for the semester project provided on Canvas

5. Specific Course Information:

a. Catalog Description

An introduction and study of the current processes and professional trends in 'Design-Build' (D/B) as a construction project delivery system. The goal of the course is to achieve a working familiarity with the organizational, management, ethical and legal principles inherent to this rapidly growing construction delivery option.

b. Prerequisite(s) or Co-requisite(s)

Senior Standing and permission (or) Graduate Standing

c. Required Course – This course is not required, but is a CNST technical elective.

6. Specific Course Goals:

a. Objectives:

The objective of this course is to build a knowledge foundation of the various principles, methods and practices currently used in Design-Build projects. Additionally, new trends and developments will be explored throughout the semester. Reference the Learning Objectives spreadsheet for a complete listing of topics discussed in the course.

b. Expected Outcomes:

Students will implement and package the various components of a Design/Build project discussed during the semester into a service-learning project in which they will develop a formal

Design/Build proposal, presentation (interview) and present in front of a panel for a commercial project.

7. List of Topics:

- The Design-Build (DB) Team
- Fundamental Characteristics of DB
- Gaining a Competitive Advantage
- Buying DB Services
- Managing DB Processes
- Developing DB Estimates
- Planning for DB Projects
- Designing for DB Projects
- Constructing DB Projects
- Presenting and Teamwork

8. Evaluation

Examination on D/B Fundamentals	15%
RFQ Response	20%
Quizzes and Homework	25%
Semester Project	40%

The semester project grade will be comprised of three elements;

- the proposal that is worth 70% of the semester project grade
- the presentation, which is worth 30% of the semester project
- the peer evaluation process, which will be used to reassign 33% of the overall semester project points between team members

9. Grading

Grading will be done to standard University of Nebraska letter grades.
Grades are determined as follows:

A+	97.0 to 100%
A	93.1 to 96.9%
A-	91.0 to 93.0%
B+	87.0 to 90.9%
B	83.1 to 86.9%
B-	81.0 to 83.0
C+	77.0 to 80.9%
C	73.1 to 76.9%
C-	71.0 to 73.0
D+	67.0 to 70.9%
D	63.1 to 66.9%
D-	60.0 to 63.0
F	59.9 and below

10. Homework Policy and Grading

All quizzes, pre-tests and homework assignments are due at the time and date listed on Canvas for this assignment. Any assignment turned in after the due date and time will be considered late. Late assignment will be accepted up to 24 hours after its due date with a 50% reduction in grade. No assignment will be accepted after that time.

The majority of all quizzes, pre-tests and homework will be completed and submitted electronically, on either Canvas or some other Learning Management System (LMS). All assignments not submitted electronically are to be completed per specific instructions that accompany the respective assignment. Your name and homework assignment number should appear at the top of each sheet that you submit in person.

11. Attendance and Participation

Punctuality, class attendance, participation and preparation Is a reflection of your professionalism. If you enter class after roll has been completed you will be considered absent. Unavoidable absences must be reported to the instructor or the Construction Management Department Office or the Graduate Assistants **prior** to the absence. Two absences, either excused or unexcused, will be allowed without penalty. Each absence thereafter will cause your course grade to be reduced by ½ grade (+ or -).

13. Make-up Policy

Exams, quizzes, attendance and homework cannot be "made-up". You will be expected to complete all requirements in a timely fashion.

14. Semester Project

The coursework for the semester will revolve around a semester service-learning project. To accomplish the semester project, the class will be divided into teams. Additional information on the semester project and the project teams will be distributed independently.

15. Code of Conduct

"Academic honesty is essential to the existence and integrity of an academic institution. The responsibility for maintaining that integrity is shared by all members of the academic community. To further serve this end, the University supports a Student Code of Conduct which addresses the issue of academic dishonesty." The Student Code of Conduct can be found at http://stuafs.unl.edu/ja/code/three.shtml

16. Accommodation for Students with Disabilities Policy

"The University of Nebraska-Lincoln is committed to a pluralistic campus community through Affirmative Action and Equal Opportunity. We assure reasonable accommodation under the Americans with Disabilities Act. Students with disabilities are encouraged to contact me for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, student must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY." More information can be found at UNL's Services for Students with Disabilities at https://www.unl.edu/ssd/